# User's manual

# POWERPACK



## IHC FUNDEX Equipment

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**Type Fundex FPP 20 SNZ**

**05.94.20SN**

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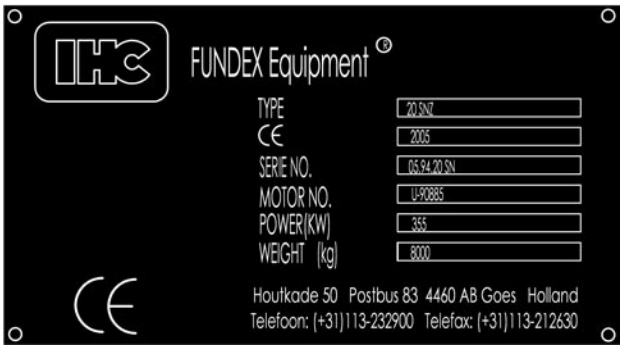
This publication is to be used for the standard version of the machine only. **IHC Fundex Equipment** cannot be held responsible for any damage resulting from the application of this publication to the machine version actually delivered.

For additional information regarding adjustments, maintenance and repair, contact the technical department of your supplier.

This publication has been written with great care. However, **IHC Fundex Equipment** cannot be held responsible for any errors occuring in this publication or for their consequences.




Name of client:

**Soletanche Bachy Pieux**
**Sillic Sissous BP 70582**
**Fr 94633 Rungis Cedex**

Machine number:

## 05.94.20SN

Type:

## Fundex FPP 20SNZ

Year of manufacturer**:**

## 2005

**Ordering spare parts**

When ordering spare parts, please state the following information:

Machine number:

## 05.94.20SN

Machine type : Fundex FPP 20SNZ.....

Page number : .....

Part number : .....

Quantity : .....

# Contents Manual

## Part 1: General



## Part 2: Diagrams



## Part 3: Spare parts lists

# Part 1: General

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# 1.1 Preface

This manual describes the utilization for a safe use and maintenance of the hydraulic powerpack 05.94.20SN by qualified personal.

Use and maintenance is only reserved to qualified personal.

It is important to all users to read this manual thoroughly, before starting the work. If problems occur, and no solutions are mentioned in this manual, please contact IHC FUNDEX Equipment.

## Security measures

If security measures are not observed, operators or spectators can be seriously injured or or it may cause damage to the machine.

· Dirt and sand are the main enemy's of hydraulic parts.

· Welding activities on powerpack doors (incl. hydraulic oil tank, the lower part of the powerpack is the fuel tank) are not allowed.

· Grinding or welding activities near disassembled or open hydraulic parts (during maintenance) is not allowed. Clean those parts anyway with fuel.

· Do not connect or separte the hydraulic flexibles while the engine is running.

· During service and maintenance the engine may not run.

· Turn of the main accumulator switch during maintenance of the electrical installation.

· When the engine is still hot, do not take away the coolingliquid filling cap.

· Do not smoke when filling the fuel tank.

· Carefullu clean up the fuel, which has been spoiled, and throw it away in the for that purpose means.

· Avoid long hair and loose clothes near moving parts of the machine.

· If the powerpack is in use, keep all doors closed (except the doors for utilization).

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# 1.2 General view powerpack


Fig. 1.01 Powerpack

1. Connection box (page 12)

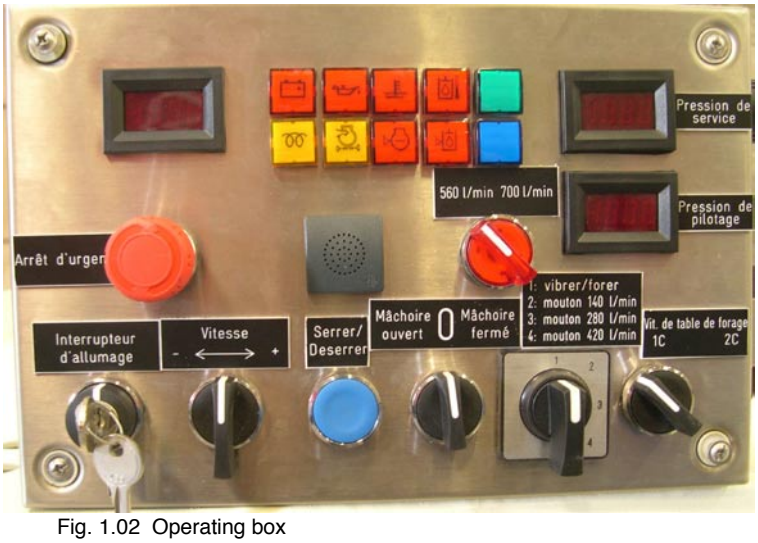
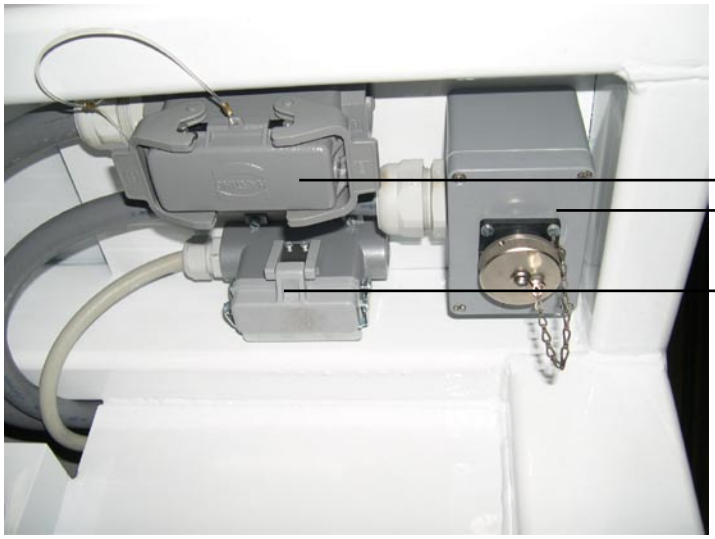



Fig. 1.02 Operating box

# 1.3 Connection Box




1. Operating Fundex
2. IHC-BOX C32
3. IHC Hammer-connection

Fig. 1.03


1. A-drilling
2. B-drilling
3. Pressure hammer (0-400)
4. Steerpressure (0-40)
5. Leakage
6. A-clamp+pull up
7. B-clamp+pull up
8. P-Hammer
9. Spare connection
10. 2e speed
11. Messure point drillpressure
12. Connection steering valve
13. T-hammer

Fig. 1.04

# 1.4 Operating box

1. Revolution counter
2. Horn
3. See Fig. 1.05b
4. Switch 560 l or 700 l
5. Workingpressure
6. Steeringpressure
7. Ignitionlock
8. Emergency stop
9. Speed
10. Clampingbox for operating
11. Clampingbox open/close
12. Pos. 1. Vibrating/drilling
    Pos. 2. Hammer 140 l/min
    Pos. 3. Hammer 280 l/min
    Pos. 4. Hammer 420 l/min
13. Second speed drilltable
14. Connection Powerpack
15. Connection Joystick
16. Connection Hammer

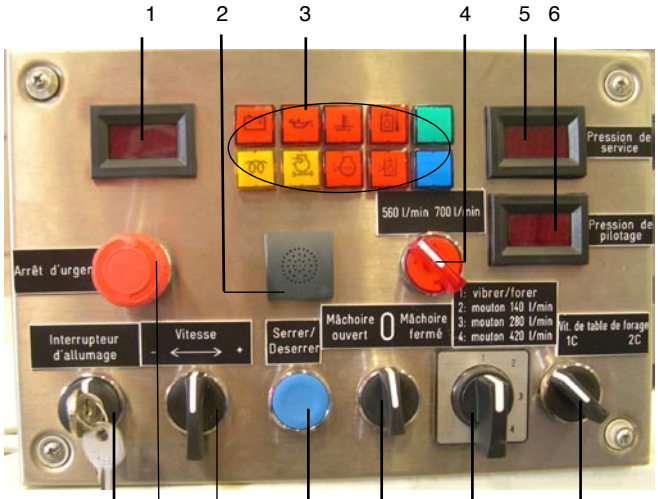


Fig. 1.05

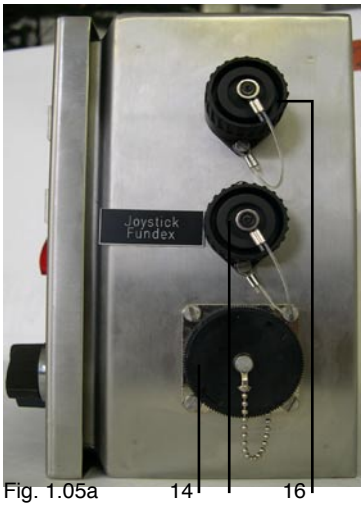


Fig. 1.05a

1. Controllamp accumulator
2. Pre-heating
3. No motoroil pressure
4. Airfilter closed
5. Temperature motoroil too high
6. Cooling liquid
7. Temperature hydraulikoil too high
8. Level hydraulikoil tank
9. On-Off button:
   On: Fundex-operating, Off: IHC-Hammer
10. Clamping pressure: ok

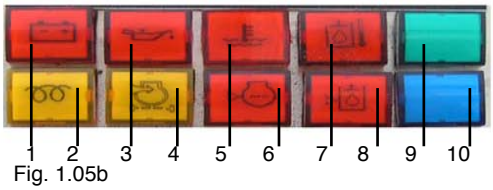


Fig. 1.05b

# 1.5 Switch box

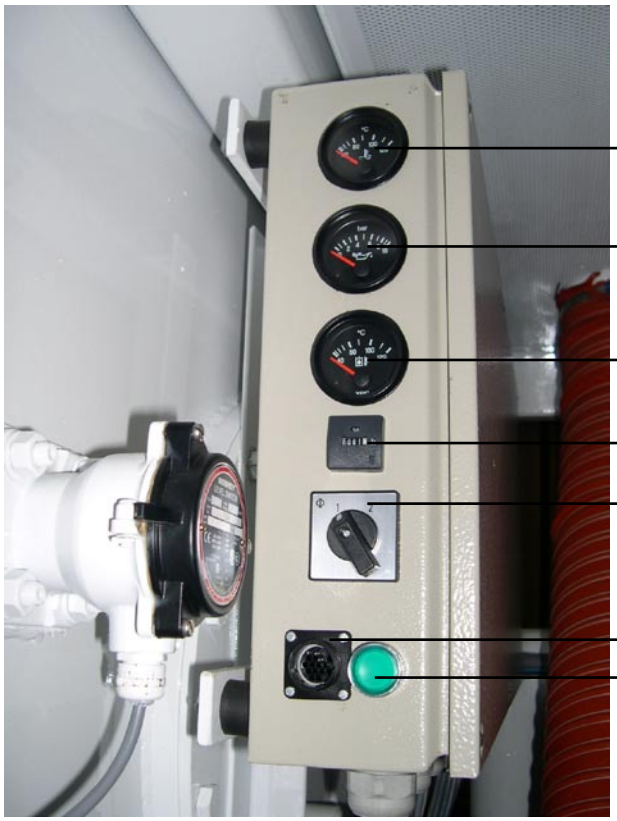



Fig. 1.06

1. Temperature coolingliquid
2. Motoroil pressure
3. Temperature hydraulic oil
4. Hour counter
5. Switch IHC-hammer
6. Diagnosis Connection DAF
7. Diagnosis lights

# 1.6 General

The Fundex powerpack is used to operate a drilltable, drillhead, vibrator, hammer, etc. and is mounted at the backside of the foundation rig.

The powerpack consists of a diesel engine and a hydraulic pump.

The powerpack is silenced 85 DBA - 7 mtr.

The chassis consists of a fuel tank of ± 1500 ltr, onto which a hydraulic tank of ± 1600 ltr and a frame consisting of rectangular tube profiles have been mounted. The engine and the pump are located on the tank, which has been reinforced.

Usually a DAF is used as the diesel engine, with an output of 355 kW at 1900 RPM. The hydraulic pump, type Poclain, has 6 outputs, 4 of which are coupled in order to obtain an oil volume of 560 l/min at 1900 RPM with a pressure of 8-10 bar.

If 5 pumps are connected , there is a flow of 700 l/min.

This flow can be controlled proportionally by means of a electric/hydraulic valve with a maximum pressure of 350 bars.

The other 2 pumps can be switched on electrically using 4 buttons on the dashboard. The oil volume is

at position
1: 0 l/min
2: 140 l/min
3: 280 l/min
4: 420 l/min.

The maximum pressure is 350 bars, but not simultaneously with the other 4 pumps.

The 4 large connections are provided with 1½" or 2" screwed quick couplings.The leakage connection has a diameter of 1½" and is also provided with a 1" or a 1½" quick coupling.
Besides these, a ¼" quick coupling (fig. 1.02) has been provided, allowing to switch the drilltable into the second speed. The pressure for this is about 20-25 bars. The whole system is of the "open" type.

Two oil coolers prevent the hydraulic oil from warming up too much. The oil coolers are driven hydraulically by means of a small auxiliairy pump.

Lighting is provided.

The dashboard is provided with the instruments required for operation and control of the engine. The hydraulic pressure of the main system is indicated.

An emergency stop is used to shut down the complete system.

The horn signalises a too low oil pressure of the diesel engine, a too high water temperature and a too low hydraulic oil level. This horn may not be dismantled.

# 1.7 Operating instructions

Before starting the engine, check the following:

- water level
- oil level
- hydraulic oil level
- ball valve for suction pipe of hydraulic system open
- hoses connected properly (see fig. 1.02)
- diesel oil level
- main contact switch

If all hoses are connected, the engine can be started and warm up at 750-1000 RPM. After some minutes, increase the speed to 1500 RPM. Make sure that the temperature increases, and check the oil pressure.

Use the control lever to operate the drilltable or the vibrator. There is friction or a brake on the lever, so that the lever can be positioned in every desired position.

**Note**: the vibrator is single-acting

Using the auxiliairy system a hydraulic hammer or a drillhead can be operated (open system). These can be pressurised using the 4 position switch. This is no proportional sytem.

The maximum pressure is 250 or 320 bars.

On the main connection for drilling/vibration the setting is 340 bars. The counter pressure is set to 20 bars. A manometer with a range of 0-400 bars on the powerpack indicates the pressure. If a hose has to be connected while the powerpack is still pressurised, this pressure can be released by means of a small ball valve.

**!! WHILE THE POWERPACK IS WORKING,**

**DO NOT OPEN THE PANELS !!**

# 1.8 Instruction piling

**IHC**

**Assembly**

1. Put 2 position switch on the main box in the powerpack in position 2 (see fig. 1.06), the green control light on the operating box is then OFF. ( fig 1.05b nr. 6).
2. Connect C32 (property client) (fig. 1.03 nr. 2).
3. Connect control lever (fig. 1.03 nr. 3).
4. Connect flexibles correctly (fig. 1.04).
   Connect flexible P of hammer.
   Connect flexible R of hammer. In relation with possible back pressure (50 bar), use at least a flexible 2HD.
   Pull flexible.
5. Check valves on P and R. Those should be closed.

**Disassembly**

1. Empty flexible P and R. Do this by opening valves on P and R. After the flexibles have been emptied completely , close the valves again. See hydraulic diagram nr. 54 (2x).

**JUNTTAN**

**Assembly**

1. Put 2 position switch on the main box in the powerpack in position 1 (see fig. 1.06), the green control light on the operating box is then ON. ( fig 1.05b nr. 6).
2. Connect adapter (supplied by IHC) or operating box IHC in combination with the JUNTTAN box (property client) (fig. 1.05 nr. 18).
3. Connect control lever on JUNTTAN box (property client) (fig. 1.03 nr. 3).
4. Connect flexibles correctly (fig. 1.04).
   Connect flexible P of hammer (nr. 8).
   Connect flexible R of hammer (nr. 12) .
   In relation with possible back pressure (50 bar), use at least a flexible 2HD. Pull flexible.
5. Check valves on P and R. Those should be closed.

**Disassembly**

1. Empty flexible P and R. Do this by opening valves on P and R. After the flexibles have been emptied completely , close the valves again. See hydraulic diagram nr. 54 (2x).

**W A R N I N G**

**If the switch IHC Hammer in postition 2**

**and the C32 has not been connected**

**the powerpack will not start.**

# 1.9 Lubrication and maintenance

For the dieselengine: see specifications

| | DAF XE 355 |
|---|---|
| Airfilter | : IHC 0400002000183 |
| Oilfilter | : IHC 0400002000237 |
| Fuelfilter | : IHC 0400002000235 |
| Pre-filter | : IHC 0400002000134 |
| Hydraulic oil | : Esso-Univis HP 46 |
| | IHC 9000006000012 |

**Hydraulic system**

Hydraulic filterelement:
IHC 0200007000025

Hydraulic pressure filterelement:
IHC 0200007000041

Replace the elements and clean the magnets every 400 hours.

The hydraulic tank and the fuel tank must be cleaned after the inspection.

Hydraulic oil: every 1000 hours or change once a year.

# 1.10 Sonometry

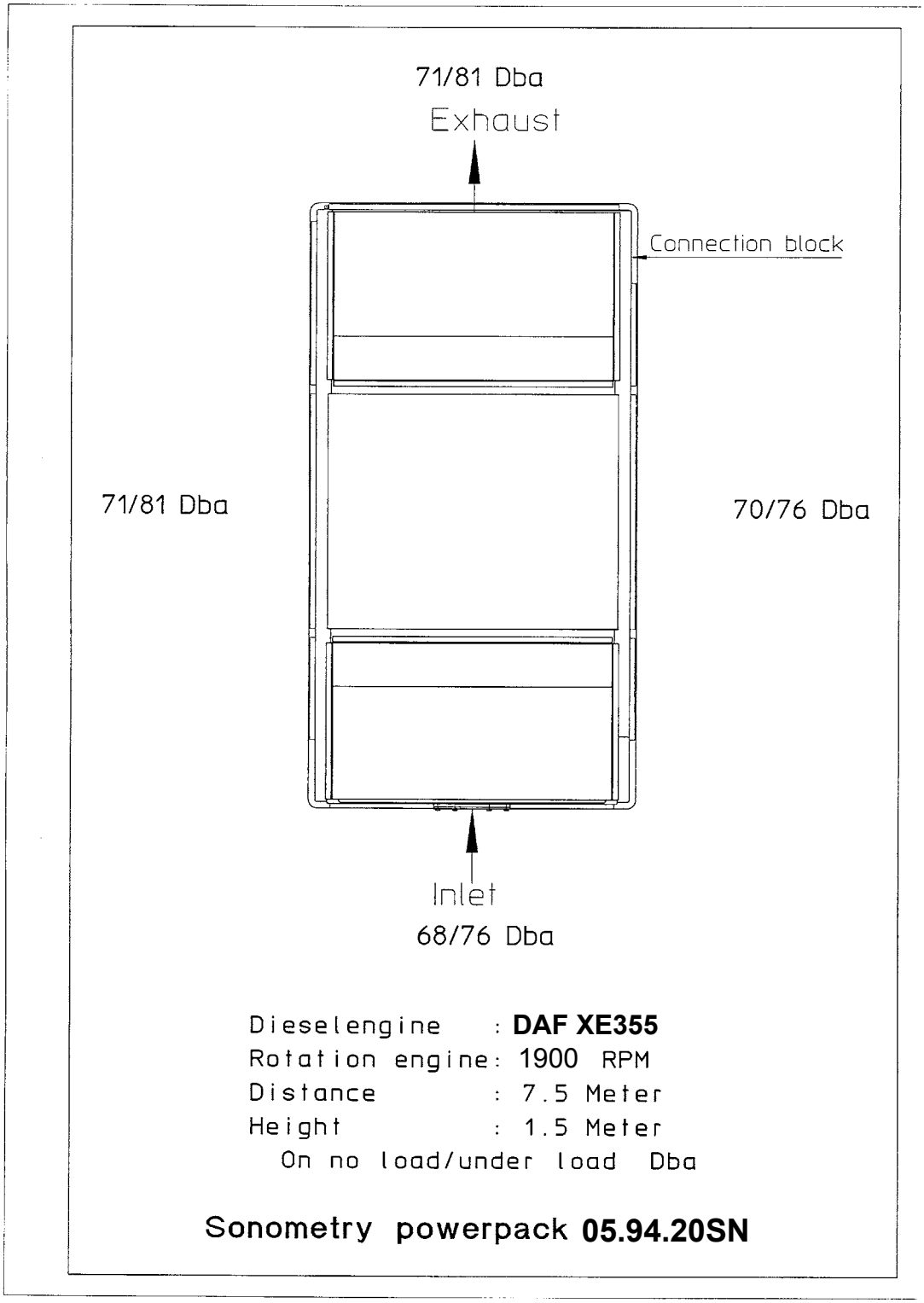



Fig. 1.07

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# 1.11 Engine DAF XE355

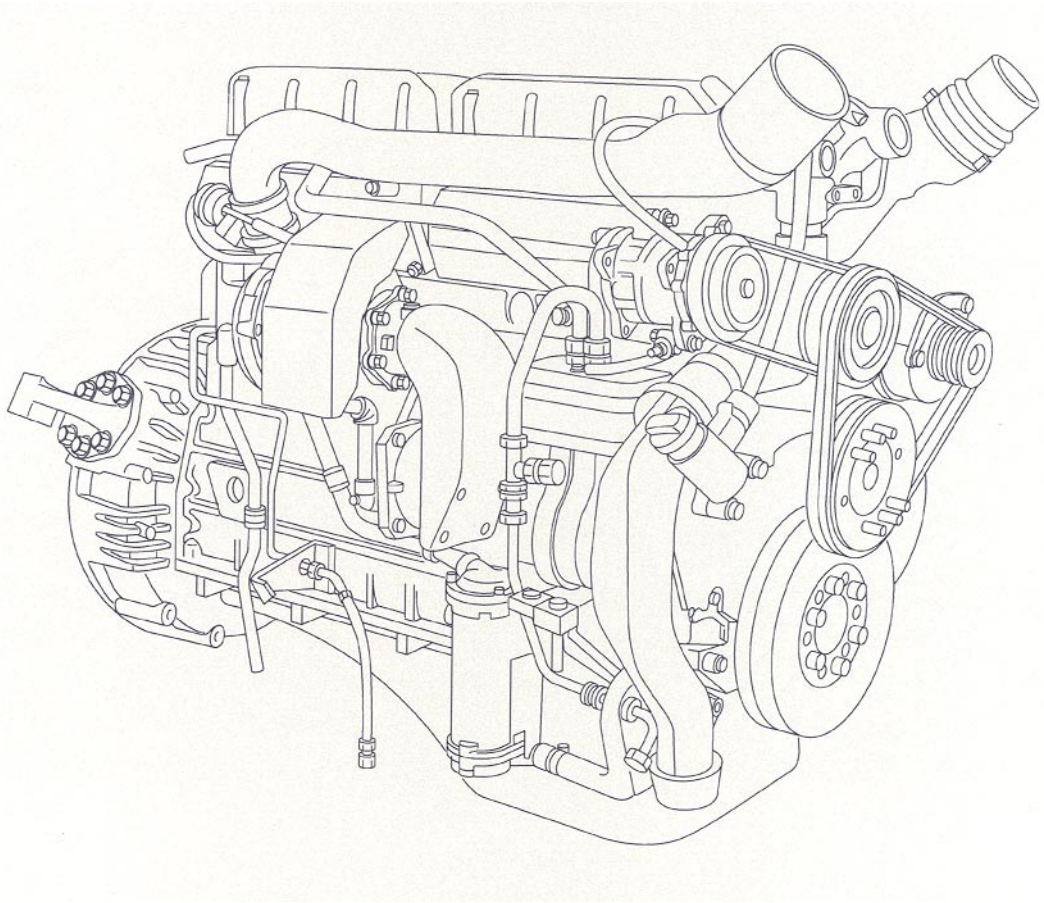

Fig. 1.08

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# 1.12 Mainpump (6H20-FOR 74-471)

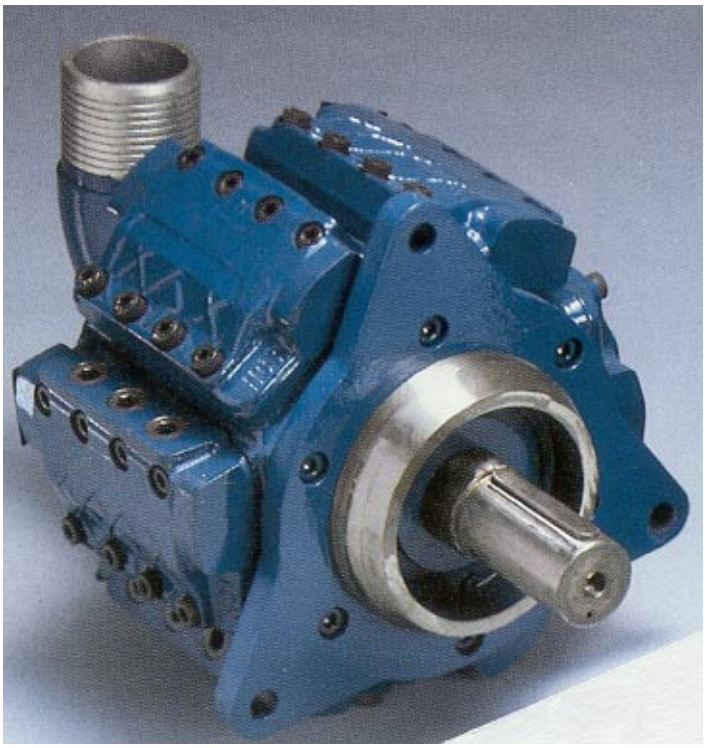

Fig. 1.09

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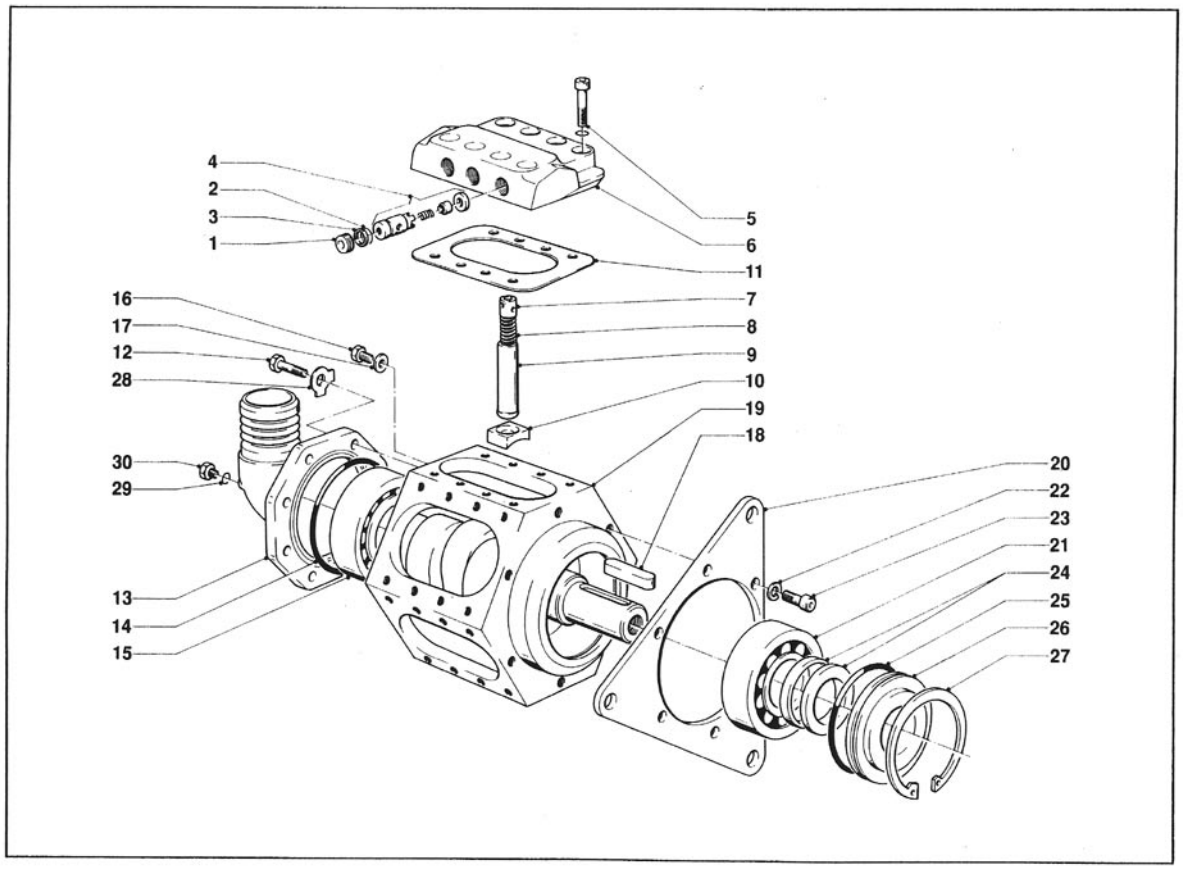
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Fig. 1.10

# Main pump (6H20-FOR 74-471)

### Replacing the valve springs

*Dismantling*:

- Having placed the pump on a work surface, loosen and remove plugs (1)
- Screw an M6 threaded rod into guide (4) tapping
- Remove O-ring seal and back-up seal (2&3)
- Pull out seat (4) with magnetic feeler (in case of difficult extraction, use small knock-out device)
- Visually check state of guide groove, compression ring, valve and seat.

*Reassembly*:

- Lubricate valve springs
- Fit valves with their springs into guides
- Install seats with magnetic feeler
- WARNING: valve seats being reversible, select face not marked by valve
- Check their position with a screw driver
- Fit new seals into their grooves (grease seal entries into cylinder blocks for easy fitting)
- Install complete guides by pushing them into their recesses with threaded rod
- Replace plugs and tighten to correct torque

### Replacing the shaft seal

*Dismantling*:

- Pull out the key (18)
- Remove fixing bolts (23) and remove stop ring (20)
- Remove O-ring (25) and the set seal rings (24)
- Visually check: condition of bearing face of seal ring, condition of O-ring groove, and of seal ring recess.

*Reassembly*:

- Grease recess
- Fit new seal ring set (24) into cover with appropriate mandrel
- Fit new o-ring (25)
- Install cover (20) and tighten these bolts (23)
- Install the key

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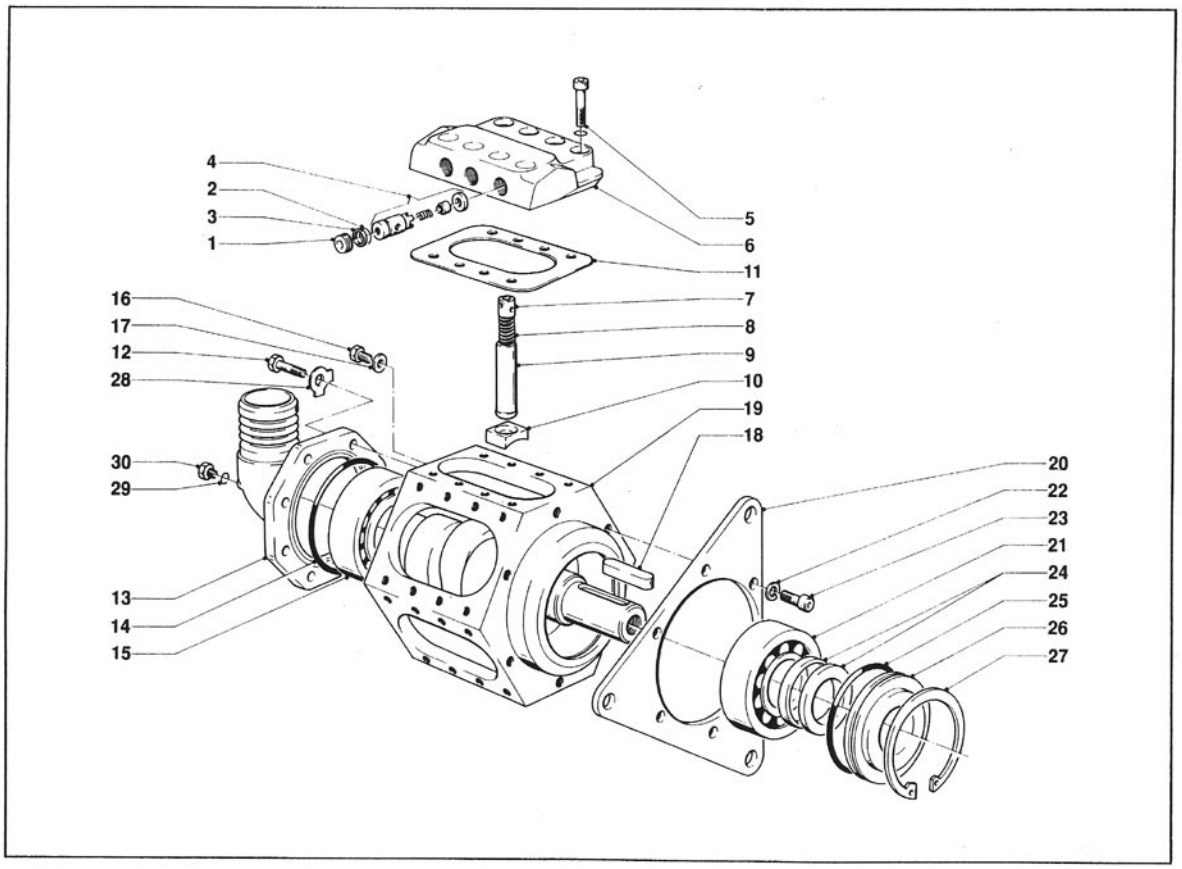
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Fig. 1.10

**Replacing the O-ring at the inlet pipe**

*Dismantling*:

- Mark position of flange (13) with respect to casing
- Remove fixing bolts (12)
- Take out inlet pipe with flange (13)
- Remove O-ring (14)
- Visually check:
    - Pipe side: seal groove and bearing face
    - Pump side: bearing face and shaft

*Reassembly:*

- Lubricate a new O-ring and fit it into its groove
- Reassemble the inlet pipe, position according to the marks made when dismantling
- Fit bolts (12) with washer
- Torque tighten (33,2 lb.ft)

CAUSES OF BREAKDOWN AND REMEDIES

| SYMPTOMS | MAIN CAUSE | SECONDARY CAUSES | REMEDIES |
|---|---|---|---|
| I - NOISY PUMP | 1 **Unsattisfactory fluid supply = cavitation** | - suction valve closed<br>- suction strainer clogged<br>- insufficient section head of oil<br>- excessive driving speed | - open valve<br>- clean strainer and line<br>- increase head of oil; diameter of suction pipe<br>- lower to normal speed |
| | 2 **Presence of air in fluid** | - connections not air-tight<br>- suction line damaged<br>- oil level too low<br>- return line above oil level in reservoir<br>- bad primimg | - tighten connections<br>- replace hose<br>- top up to normal level<br>- submerge return lines<br>- bleed casing again |
| | 3 **Pump-motor misalignment** | | - re-align pump coupling; check condition of coupling |
| | 4 **Bad sealing of discharge valves** | - foreign matter or wear | - remove discharge plugs,springs and valves,<br>- check valve land (clean or replace)<br>- check condition of seat |
| | 5 **Pump damaged or worn** | | - recondition or replace |
| II - EXCESSIVE HEAT AT PUMP | 1 **Increase in fluid temperature** | - cooling system inadequate or faulty<br>- volume of oil insufficient<br>- oil wire<br>- excessive pressure drop within circuit<br>- oil too viscous | - examine cooling circuit<br>- examine oil level and size of tank<br>- adjuste valves<br>- examine pipe bores<br>- change oil |
| III - INSUFFICIENT DELIVERY OF FLOW | 1 **Bad priming**<br>2 **Bad sealing of discharge valves**<br>3 **Inadequate fluid supply**<br>4 **Rotation speed of prime mover too slow**<br>5 **Pump damaged or worn** | - foreign matter under valve | - re-prime<br>- see § I, para 4.<br>- see § I, para 1.<br>- check power rating<br>- recondition or replace |
| IV - PUMP WILL NOT GENERATE PRESSURE | 1 **Same causes as in § III, paras 1, 2 & 3.**<br>2 **Pressure relief valve calibrated too low**<br>3 **Receiver or transmission parts damaged** | | - re-calibrate to normal<br>- repair |
| V - EXCESSIVE DELIVERY OF FLOW | 1 **Excessive driving speed of pump** | | - check driving speed |
| VI - LEAKS OR SEEPAGE | 1 **From discharge plugs** | - cracked or extruded seals<br>- cracked back-up seals | - replace seals and back-up seals<br>- check sealing<br>- torque tighten (see table)<br>- check discharge pressure |
| | 2 **Between casing and suction pipe (PL) or rear cover (PS)** | - seals damaged | - change seal<br>- check sealing surfaces on casing and groove<br>- torque tighten (see table) |
| | 3 **At shaft end** | - seal damaged | - replace lip seal<br>- check sealing on shaft |
| | 4 **Between casing and cylinder head** | | - retighten screws to correct torque (see table) |